RECOMMENDATIONS: DIRECTIONS FOR FUTURE GROUNDWATER PROTECTION

The GCC is directed by statute to include in its annual report a "list and description of current and anticipated groundwater problems" and to "set forth the recommendations of the Council" (s. 15.347(13)(g), Wis. Stats.). In this section the GCC identifies its recommendations for future groundwater protection and management needs to state agencies, the Governor, the Legislature, and the citizens of Wisconsin. These recommendations include top priorities of immediate concern, on-going efforts that require continued support, and emerging issues that will need to be addressed in the near future.

Priority Recommendations

Evaluate the occurrence of viruses and other pathogens in groundwater and groundwater-sourced water supplies, and develop appropriate response tools. Recently, viruses and other microbial pathogens have been found in municipal and domestic wells, challenging previous assumptions about their occurrence. The legislature and agencies should support research to refine our understanding of pathogens in groundwater and their threat to human health. Agencies should also work with partners to increase awareness of waste disposal choices, their risks and costs. Background on the issue and the rationale for the recommendation are found at:
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/MicrobialAgents.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/Benefits/DetectMonMicrobes.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DHSactivities.pdf

Implement practices that protect groundwater from nitrate and associated contaminants (pesticides, pharmaceuticals, and their degradates). Nitrate contamination that approaches unsafe levels in drinking water is pervasive in Wisconsin – posing an acute risk to infants and a chronic risk of serious disease in adults. Agencies should validate and promote practices that lead to efficient use of agricultural nitrogen and produce safer drinking water. The legislature should support the implementation of these practices with appropriate funding mechanisms. Background on the issue and the rationale for the recommendation are found at:
http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DNRactivities.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DATCPactivities.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Nitrate.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Pesticides.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/Benefits/PharmPCPedc.pdf

Support the sustainable management of groundwater quantity and quality in the state to ensure that water is available to be used to protect and improve our health, economy, and environment now and into the future. This includes:

- supporting an inventory of information on the location, quantity, and uses of the state's groundwater;
- supporting targeted research and modeling of the impact of groundwater withdrawals on other waters of the state; and
- supporting proactive regional groundwater planning in areas with limited groundwater resources where increased groundwater use and development/population growth pressures are leading to water availability and sustainability issues related to groundwater and surface water resources.

Background on the issue and the rationale for the recommendation are found at:
http://dnr.wi.gov/topic/groundwater/documents/GCC/Report/WIgroundwaterLaw.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DNRactivities.pdf

http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuantity/WaterUse.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuantity/RegionalDrawdowns.pdf

Ongoing Recommendations

Without ongoing attention to the following needs, Wisconsin cannot address the priority recommendations (see above) or begin to understand emerging issues (see below).

Support implementation of the Statewide Groundwater Monitoring Strategy. Chapter 160 of the Wisconsin Statutes requires the DNR to work with other agencies and the GCC to develop and operate a system for monitoring and sampling groundwater to determine whether harmful substances are present (s. 160.27, Wis. Stats.). The strategy has been incorporated into the DNR Water Monitoring Strategy (*http://dnr.wi.gov/org/water/monitoring/strategy.htm*), but needs are constantly evolving as new problems emerge. For example, food processors, homeowners, municipalities, and well drilling contractors need more information about the origin and extent of naturally occurring contaminants such as arsenic and other heavy metals, acidic conditions, sulfate, total dissolved solids, radium and uranium. Wisconsin should continue to encourage research efforts that will provide information for addressing these issues. State agencies, the university, and federal and local partners should continue to implement and modify this strategy to efficiently meet monitoring objectives. Background on the issue and the rationale for the recommendation are found at:
http://dnr.wi.gov/org/water/dwg/gcc/rtl/2012/Benefits/Drawdowns.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuantity/GroundwateLevelNetwork.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuantity/QuantityQuality.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Arsenic.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Radionuclides.pdf

Continue to catalog Wisconsin's groundwater resources. Management and protection of Wisconsin's groundwater resources requires publically-accessible and up-to-date data in order to foster informed decisions, not only on state policy matters but also for sound business decisions on siting or technology investments. State agencies and the University should continue to collect, catalog, share, and interpret new data about Wisconsin's groundwater so that it can be used by health care providers, people seeking business locations, as well as homeowners and local governments.

Continue to support applied groundwater research. Numerous years of state budget cuts and increased costs have reduced the number of groundwater research projects that are funded each year (see *http://dnr.wi.gov/org/water/dwg/gcc/rtl/2012/MonitoringResearch/AllProjects.doc*). Continued cuts will hamper the State's ability to address critical groundwater monitoring and research needs in the future. Research is necessary to identify and test cost-effective groundwater protection strategies that can prevent groundwater problems before they need to be remediated at a much greater cost. State agencies and the Legislature should work to restore adequate funding to answer the key groundwater questions facing Wisconsin water suppliers and to seek partnerships to leverage additional research support.

Emerging Issues

Frac sand mining. In the past two years unprecedented growth of the frac sand mining and processing industry has occurred in west-central Wisconsin; growth is expected for another decade. The potential impact of this industry on groundwater resources has not been comprehensively evaluated to avoid problems and plan for restoration. Wisconsin agencies and the legislature should

support research and field investigations to understand how this industry might impact groundwater, and should partner with industry to rapidly develop and adapt best-management practices for mining and long-term site restoration.

Metallic mining. During 2011 a proposed iron mine in northern Wisconsin generated significant public discussion. Several lead, zinc, and copper mines have also been proposed around the state. These proposed mines are located in sparsely-populated regions where background information on groundwater resources is often incomplete. Workers, residents, and mining operators will require substantial supplies of water for drinking and processing ore. The state should support background data collection and groundwater assessments to inform both public debate and technical discussions about potential mining.

Dairy industry expansion and concentration. During 2011 and 2012 several animal feeding operations that house thousands of animals have been sited or proposed in Wisconsin. These operations require large quantities of groundwater and must also dispose of large volumes of animal waste. Wisconsin should support policies and research that allows for effective siting and efficient operation of these facilities while protecting groundwater quality and quantity. Background on the issue and the rationale for the recommendation are found at:
http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DNRactivities.pdf
http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DATCPactivities.pdf

Evaluate potential impacts of climate change on Wisconsin's groundwater. Climate change will likely increase the frequency and severity of weather patterns that may produce unprecedented flooding or drought conditions. As a result, land and water use patterns may also change and affect the groundwater supply. These may include biological or chemical contamination issues or increased demand for groundwater by agricultural, municipal, and commercial users. More work is needed to determine the range of possible climates in Wisconsin's future. Work is also needed on feedback mechanisms between climate and groundwater to fully characterize possible changes to Wisconsin's groundwater resource. This research will help identify drought response and long-term management strategies for Wisconsin's groundwater supply.